Flexible Budgets and Standard Costs

Chapter 23

Wild and Shaw

Fundamental Accounting Principles

25th Edition

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Chapter 23 Learning Objectives

CONCEPTUAL

C1 Define standard costs and explain how standard cost information is useful.

ANALYTICAL

A1 Analyze changes in sales from expected amounts.

PROCEDURAL

P1 Prepare a flexible budget and interpret a flexible budget performance report.

P2 Compute the total cost variance.

P3 Compute direct materials and direct labor variances.

P4 Compute overhead controllable and volume variances.

P5 Compute overhead spending and efficiency variances. (*Appendix 23A*)

P6 Prepare journal entries for standard costs and account for price and quantity variances.
(*Appendix 23A*)

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Learning Objective P1

Prepare a flexible budget and interpret a flexible budget performance report.

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Fixed and Flexible Budgets

Managers use budgets to control operations and see that planned objectives are met.

- A *master budget* is based on a predicted level of activity for the budget period.
- **Budget reports** – compare actual results to budgeted results.
- **Fixed budget,** *static budget,* based on one predicted amount of sales or other activity measure.
- A **flexible budget,** or *variable budget,* based on more than one amount of sales or other activity measure.

Learning Objective P1: Prepare a flexible budget and interpret a flexible budget performance report.

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Fixed Budget Performance Report

A **fixed budget *is based on one*** predicted amount of sales.

Exhibit 23.2

Fixed Budget Performance Report For Month Ended January 31	Fixed Budget	Actual Results	Variances*
Sales (in units)	100	140	
Sales (in dollars)	$80,000	$105,000	$25,000 F
Variable costs	36,000	54,600	18,600 U
Contribution margin	$44,000	50,400	6,400 F
Fixed costs	20,000	20,400	400 U
Income	$24,000	$30,000	$6,000 F

- Fixed budget performance report compares actual results with results expected under a fixed budget.
- This fixed budget is based on 100 units, but 140 actual units were sold resulting in the variances shown here.

Learning Objective P1: Prepare a flexible budget and interpret a flexible budget performance report.

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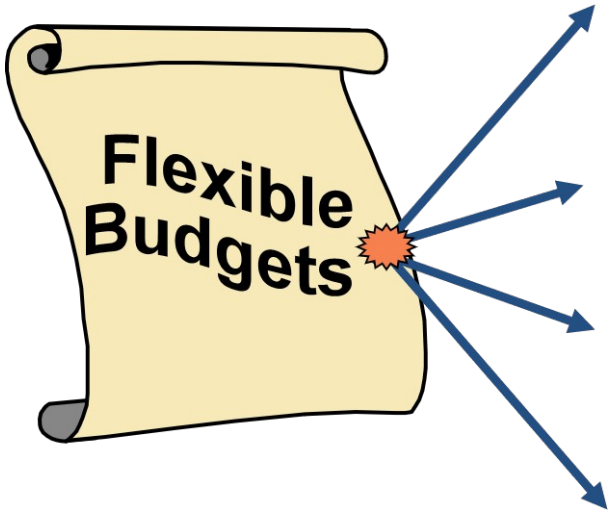
Purpose of Flexible Budgets



Prepared **before** period begins is based on several levels of activity

Provide a “what-if” analysis that includes best-case and worst-case activity levels.

Provides an “apples to apples” comparison.

Prepared **after** period ends help evaluate performance. Management can focus on problems.

Learning Objective P1: Prepare a flexible budget and interpret a flexible budget performance report.

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Preparation of Flexible Budgets

Exhibit 23.3

SOLCEL
Flexible Budgets

For Month Ended January 31	Variable Amount per Unit	Total Fixed Cost	Flexible Budget for Unit Sales of 10,000	12,000	14,000
Sales	$10.00		$100,000	$120,000	$140,000
Variable costs					
Direct materials	1.00		10,000	12,000	14,000
Direct labor	1.50		15,000	18,000	21,000
Indirect materials	0.20		2,000	2,400	2,800
Sales commissions	2.10		21,000	25,200	29,400
Total variable costs	4.80		48,000	57,600	67,200
Contribution margin	$ 5.20		$ 52,000	$ 62,400	$ 72,800
Fixed costs					
Depreciation—Machinery		$28,000	28,000	28,000	28,000
Supervisory salaries		11,000	11,000	11,000	11,000
Insurance		1,000	1,000	1,000	1,000
Total fixed costs		$40,000	40,000	40,000	40,000
Income			$ 12,000	$ 22,400	$ 32,800

Variable: Amounts equal Budgeted unit sales × Variable amount per unit

Fixed: Amounts constant at all sales levels

Total Budgeted Costs = Total Fixed Costs + (Total Variable Cost Per Unit x Units of Activity).

Learning Objective P1: Prepare a flexible budget and interpret a flexible budget performance report.

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Flexible Budget Performance Report

A flexible budget performance report compares actual performance and budgeted performance based on *actual level*.

Exhibit 23.4

Favorable sales variance because average selling price was greater than $10.00 per unit.

Unfavorable total direct materials and direct labor variances because actual costs are greater than expected.

Favorable sales commissions variance because actual sales commissions are less than expected.

SOLCEL
Flexible Budget Performance Report

For Month Ended January 31	Flexible Budget (12,000 units)	Actual Results (12,000 units)	Variances
Sales	$120,000	$125,000	$5,000 F
Variable costs			
Direct materials	12,000	13,000	1,000 U
Direct labor	18,000	20,000	2,000 U
Indirect materials	2,400	2,100	300 F
Sales commissions	25,200	24,300	900 F
Total variable costs	57,600	59,400	1,800 U
Contribution margin	62,400	65,600	3,200 F
Fixed costs			
Depreciation—Machinery	28,000	28,000	0
Supervisory salaries	11,000	11,000	0
Insurance	1,000	1,200	200u
Total fixed costs	40,000	40,200	200u
Income	$ 22,400	$ 25,400	$3,000 F

Learning Objecti [illegible] performance report.

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Learning Objective C1

Define standard costs and explain how standard cost information is useful.

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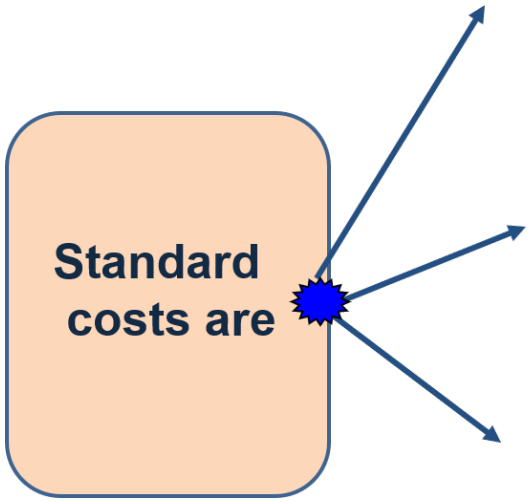
Standard Costing

Standard costs can be used in a flexible budgeting system to enable management to better understand the reasons for variances



Preset costs for delivering a product or service under normal conditions.

The expected level of performance.

Manufacturers use standard costing for direct materials, direct labor and overhead costs.

Learning Objective C1: Define standard costs and explain how standard cost information is useful.

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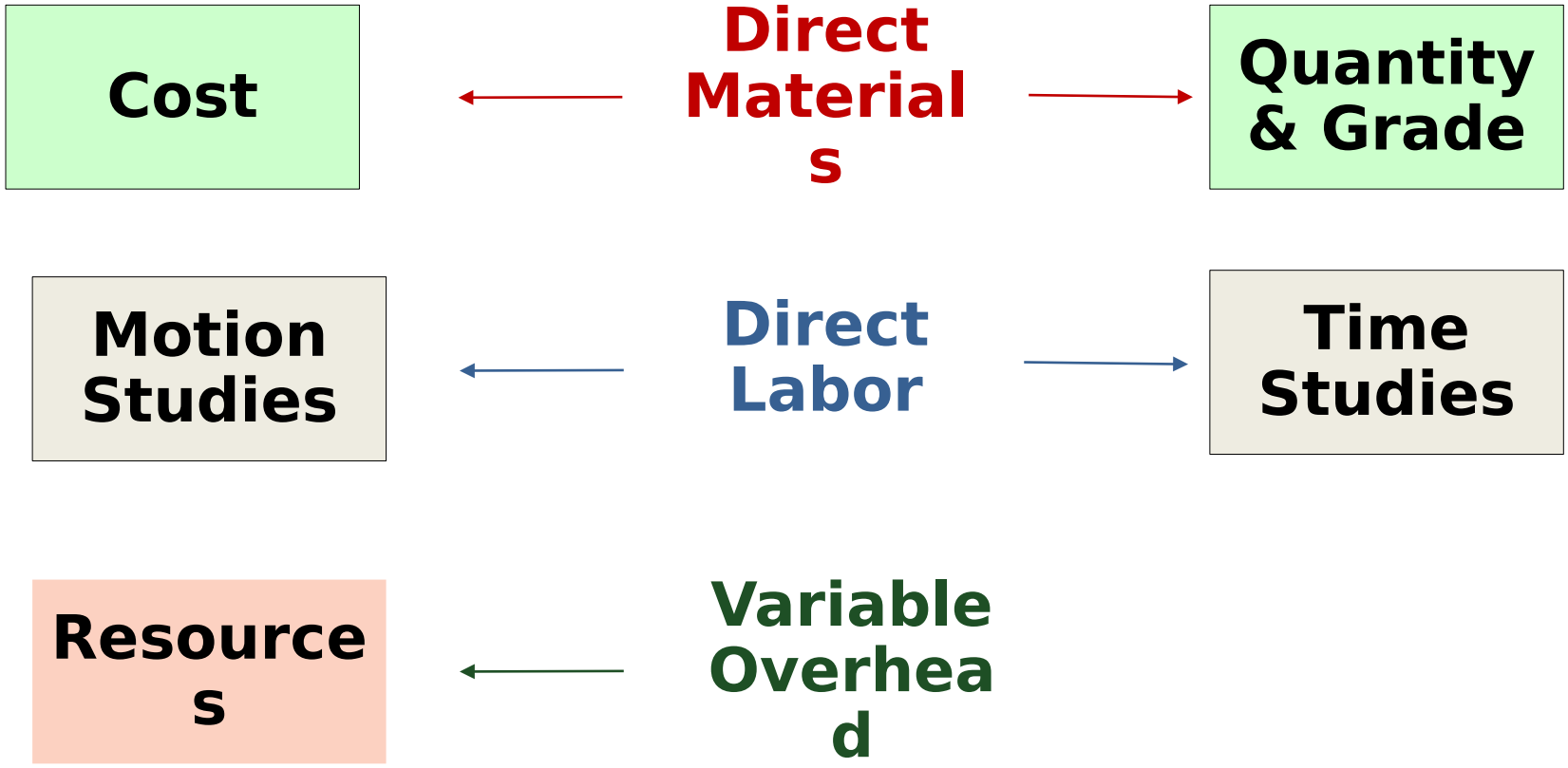
Setting Standard Costs



Learning Objective C1: Define standard costs and explain how standard cost information is useful.

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Standard Costs Example

The standard costs of direct materials, direct labor, and overhead for one bat, manufactured by *ProBat*, are shown below. This is called a *standard cost card.*

Exhibit 23.5

STANDARD COST CARD			
Inputs	Standard Quantity or Hours	Standard Price or Rate	Standard Cost per Unit
Direct materials	2.2 pounds	$10 per pound	$22
Direct labor	2.0 DLH	$15 per DLH	30
Overhead	2.0 DLH	$5 per DLH	10
Total			$62

***These standard cost amounts are then used* to prepare manufacturing budgets for a budgeted level of production.**

Learning Objective C1: Define standard costs and explain how standard cost information is useful.

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Learning Objective P2

Compute the total cost variance.

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Cost Variances

Cost variance is the **difference between actual and standard cost.**

If actual cost < standard cost
Variance is favorable (F).

If actual cost > standard cost
Variance is unfavorable (U).

Learning Objective P2: Compute the total cost variance.

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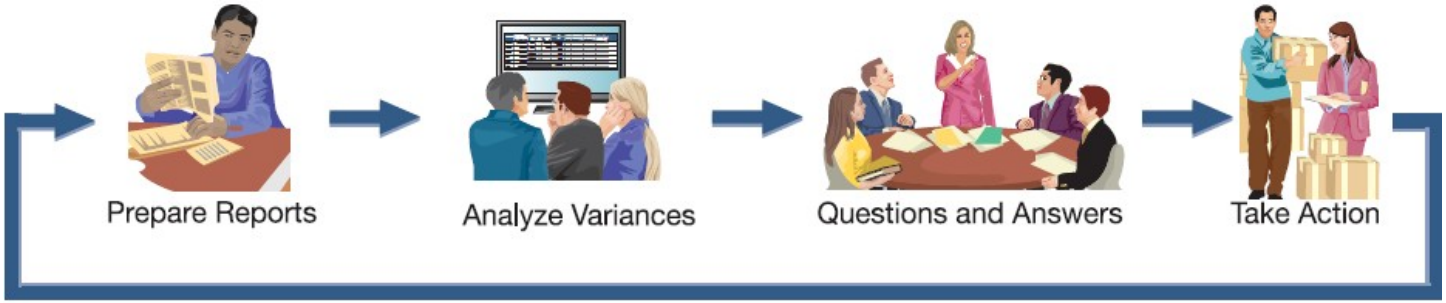
Cost Variance Analysis

Exhibit 23.6



1. Preparing a standard cost performance report.
2. Computing and analyzing variances.
3. Identifying questions and their answers.
4. Taking corrective and strategic actions.

Learning Objective C1: Explain process costing and contrast it with job order costing.

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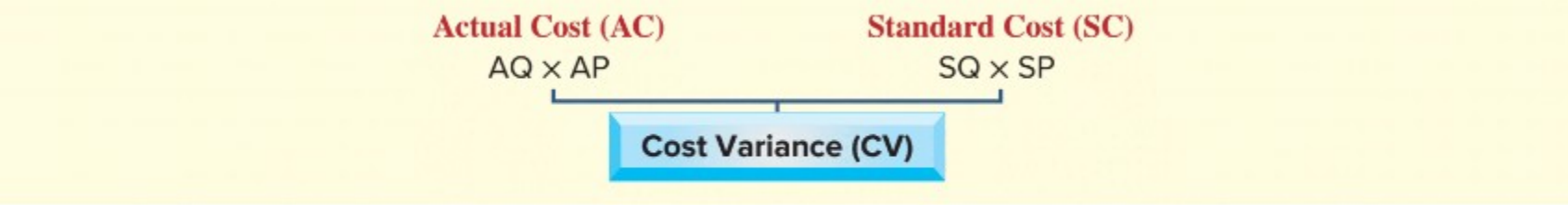
Cost Variance Computation

Management needs information about the factors causing a cost variance, but first it must properly compute the variance. In its most simple form, a cost variance (CV) is computed as:

Exhibit 23.7



*AQ is actual quantity; AP is actual price; SQ is standard quantity allowed for actual output; SP is standard price.

- **Actual quantity** (AQ) is the actual amount of direct material or direct labor used to manufacture the actual quantity of output.
- **Standard quantity** (SQ) is the standard amount of input for the actual quantity of output.

- **Actual price** (AP) is the actual amount paid to acquire the actual direct material or direct labor used during the period.
- **Standard price** (SP) is the standard price.

Learning Objective P2: Compute the total cost variance.

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Learning Objective P3

Compute direct materials and direct labor variances.

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Direct Materials and Direct Labor Variances

Two main factors cause materials and labor variances:

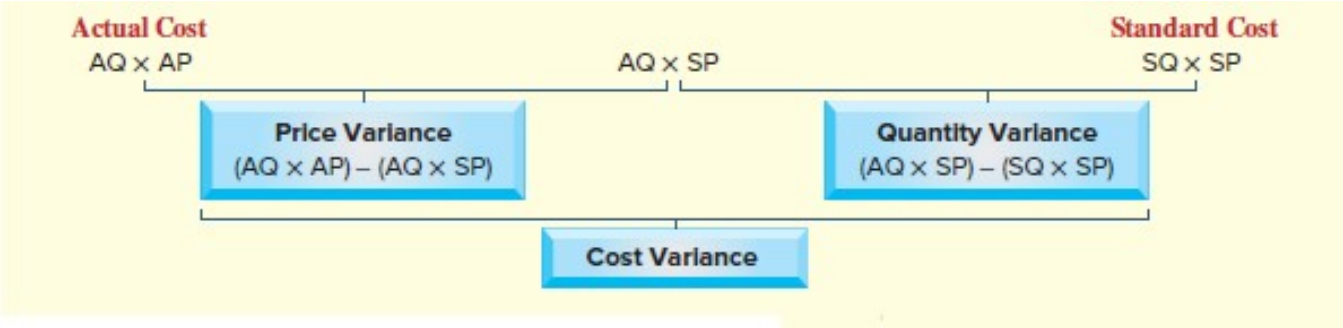

Exhibit 23.8

Exhibit 23.9

Price Variance (PV) = [**Actual Price** (AP) − **Standard Price** (SP)] × **Actual Quantity** (AQ)

Quantity Variance (QV) = [**Actual Quantity** (AQ) − **Standard Quantity** (SQ)] × **Standard Price** (SP)

Learning Objective P3: Compute direct materials and direct labor variances.

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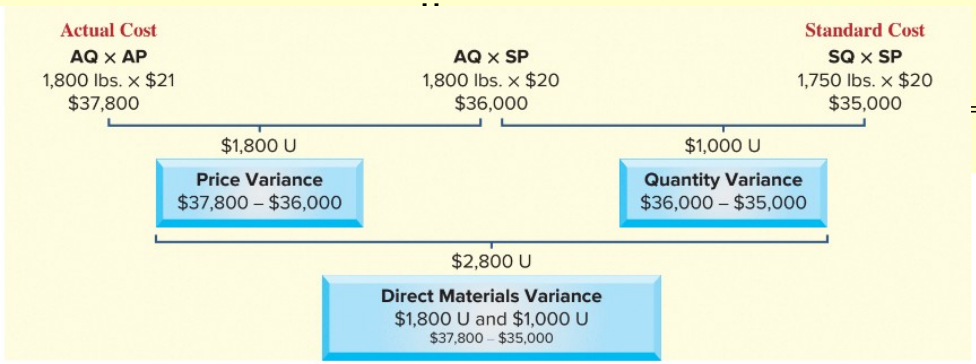
Direct Materials Variances

G-Max produced and sold 3,500 units Used 1,800 pounds of DM at $21.00 per lb. Standard is 1,750 lbs. (0.5 lbs. per unit) at $20 per lb.

Direct Materials	Quantity		Price per Unit	Cost
Actual quantity and price	1,800 lbs.	×	$21 per lb.	$37,800
Standard quantity and price	1,750	×	$20 per lb.	35,000
Direct materials variance				**2,800 U**

Exhibit 23.10



*AQ is actual quantity; AP is actual price; SP is standard price; SQ is standard quantity allowed for actual output.

Learning Objective P3: Compute direct materials and direct labor variances.

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Evaluating Direct Materials Variances

Who is responsible for direct material cost variances?

I am not responsible for this unfavorable material quantity variance.

You purchased cheap material, so my people had to use more of it.

You used too much material because of poorly trained workers and poorly maintained equipment.

Learning Objective P3: Compute direct materials and direct labor variances.

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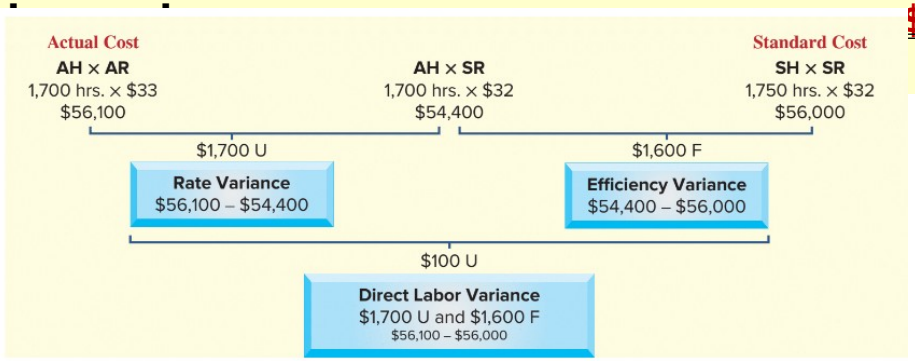
Direct Labor Variances

G-Max produced and sold 3,500 units Used 1,700 hours of DL at $33.00 per hr. Standard is 1,750 lbs. (0.5 hr. per unit) at $32 per hr.

Direct Labor	Quantity		Rate per Hour	Cost
Actual quantity and rate	1,700 hrs.	×	$33 per DLH	= $56,100
Standard quantity and rate	1,750 hrs.*	×	$32 per DLH	= 56,000
Direct la				**$ 100 U**

*Standard quantity = 3,500 units × 0.5 standard DLH per unit

Exhibit 23.11



*We use hours (H) for quantity (Q) and the wage rate (R) for price (P). Thus: AH is actual direct labor hours; AR is actual wage rate; SH is standard direct labor hours allowed for actual output; SR is standard wage rate.

Learning Objective P3: Compute direct materials and direct labor variances.

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Evaluating Direct Labor Variances

One possible explanation of G-Max's labor rate and efficiency variances is the use of workers with different skill levels.

Using highly paid skilled workers to perform unskilled tasks results in an unfavorable rate variance.

However, fewer labor hours might be required for the work resulting in a favorable efficiency variance.

High skill, high rate

Low skill, low rate

Learning Objective P3: Compute direct materials and direct labor variances.

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Learning Objective P4

Compute overhead controllable and volume variances.

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Flexible Overhead Budgets

G-MAX
Flexible Overhead Budgets

For Month Ended May 31	Variable Amount	Total Fixed	Flexible Budget at Capacity Level of			
			70%	80%	90%	100%
Production (in units)	1 unit		3,500	4,000	4,500	5,000
Factory overhead						
Variable costs						
Indirect labor	$0.80/ unit		$ 2,800	$ 3,200	$ 3,600	$ 4,000
Indirect materials	0.60/unit		2,100	2,400	2,700	3,000
Power and lights	0.40/unit		1,400	1,600	1,800	2,000
Maintenance	0.20/unit		700	800	900	1,000
Total variable overhead costs	$2.00/ unit		7,000	8,000	9,000	10,000
Fixed costs (per month)						
Building rent		$ 2,000	$ 2,000	$ 2,000	$ 2,000	$ 2,000
Depreciation—Machinery		4,000	4,000	4,000	4,000	4,000
Supervisory salaries		6,000	6,000	6,000	6,000	6,000
Total fixed overhead costs		$12,000	12,000	12,000	12,000	12,000
Total overhead			$19,000	$20,000	$21,000	$22,000

Exhibit 23.12

Learning Objective P4: Compute overhead controllable and volume variances.

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Standard Overhead Rate

Step 1: Determine an Allocation Base

Standard Overhead Rate

Step 2: Predict an Activity Level

Step 3: Compute the Standard Overhead Rate

$$\text{Standard overhead rate} = \frac{\text{Budgeted overhead at predicted activity level}}{\text{Standard allocation base at predicted activity level}}$$

Learning Objective P4: Compute overhead controllable and volume variances.

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Computing Overhead Variances

Overhead variance is the difference between the actual total overhead and the standard overhead applied.

$$\text{Standard overhead applied} = \text{Actual production} \times \text{Standard amount of allocation base} \times \text{Standard overhead rate}$$

Exhibit 23.13

$$= \frac{\$20,000}{2,000 \text{ DLH}} = \$10 \text{ per DLH}$$

$$\text{Overhead variance} = \text{Actual total overhead} - \text{Standard overhead applied}$$

Exhibit 23.14

Actual total overhead (given)	$18,150
Standard overhead applied (from above)	17,500
Overhead variance	$ 650 U

Learning Objective P4: Compute overhead controllable and volume variances.

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Volume Variance

$$\text{Volume variance} = \text{Budgeted overhead} - \text{Standard overhead applied}$$

Actual total overhead (given)	$18,150
Standard overhead applied (from above)	17,500
Overhead variance	$ 650 U

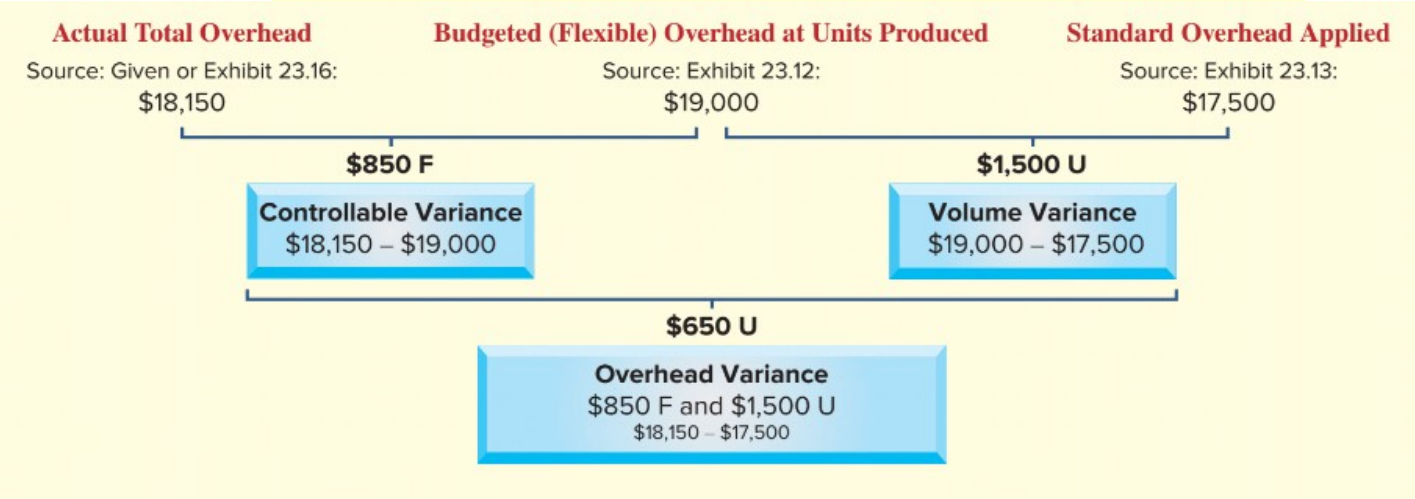

Exhibit 23.15

Learning Objective P4: Compute overhead controllable and volume variances.

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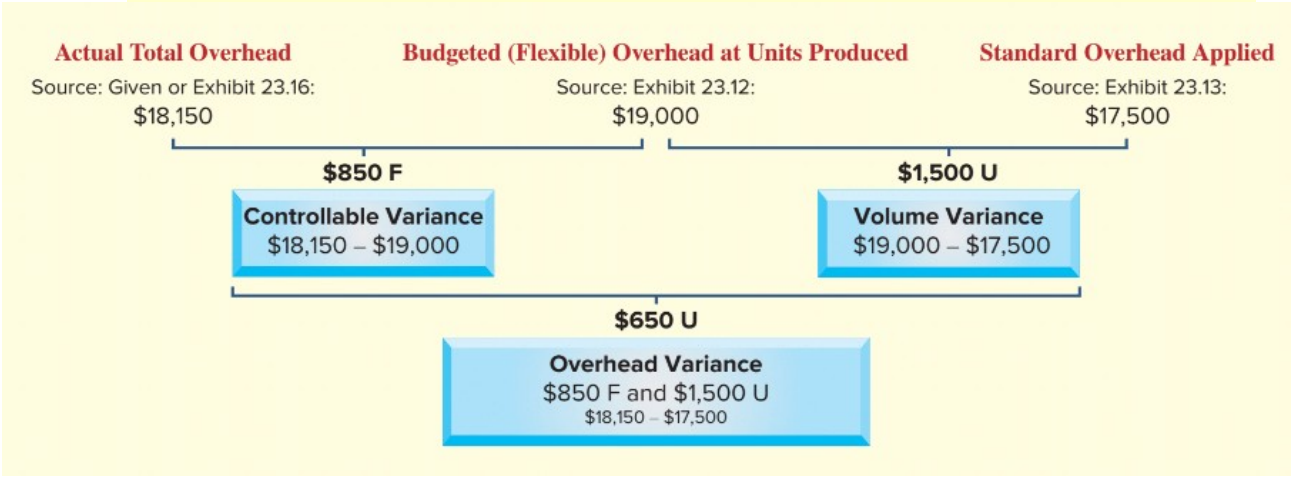
Controllable Variance

Controllable variance = Actual total overhead - Budgeted (flexible) total overhead at *actual* units produced

Controllable Variance	
Actual total overhead (given)	$18,150
Budgeted (flexible) overhead at units produced	19,000
Controllable variance	$ 850 U

Exhibit 23.15



Learning Objective P4: Compute overhead controllable and volume variances.

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Overhead Variance Report

G-MAX
Overhead Variance Report For Month Ended May 31

Production Level	
Expected	**80% of capacity (4,000 units)**
Actual	**70% of capacity (3,500 units)**

Controllable Variance	**Flexible Budget**	**Actual Results**	**Variances**
Variable overhead costs			
Indirect labor	$ 2,800	$ 2,375	**$ 425 F**
Indirect materials	2,100	1,925	**175 F**
Power and lights	1,400	1,450	**50 U**
Maintenance	700	600	**100 F**
Total variable overhead costs	7,000	6,350	**650 F**
Fixed overhead costs			
Building rent	2,000	2,000	**0**
Depreciation—Machinery	4,000	4,000	**0**
Supervisory salaries	6,000	5,800	**200 F**
Total fixed overhead costs	12,000	11,800	**200 F**
Total overhead costs	$19,000	$18,150	**$ 850 F**
Volume Variance			
Budgeted (flexible) overhead			$19,000
Standard overhead applied			17,500
Volume variance			**$ 1,500 U**
Total overhead variance ($850 F and $1,500 U)			**$ 650 U**

Exhibit 23.16

Learning Objective P4: Compute overhead controllable and volume variances.

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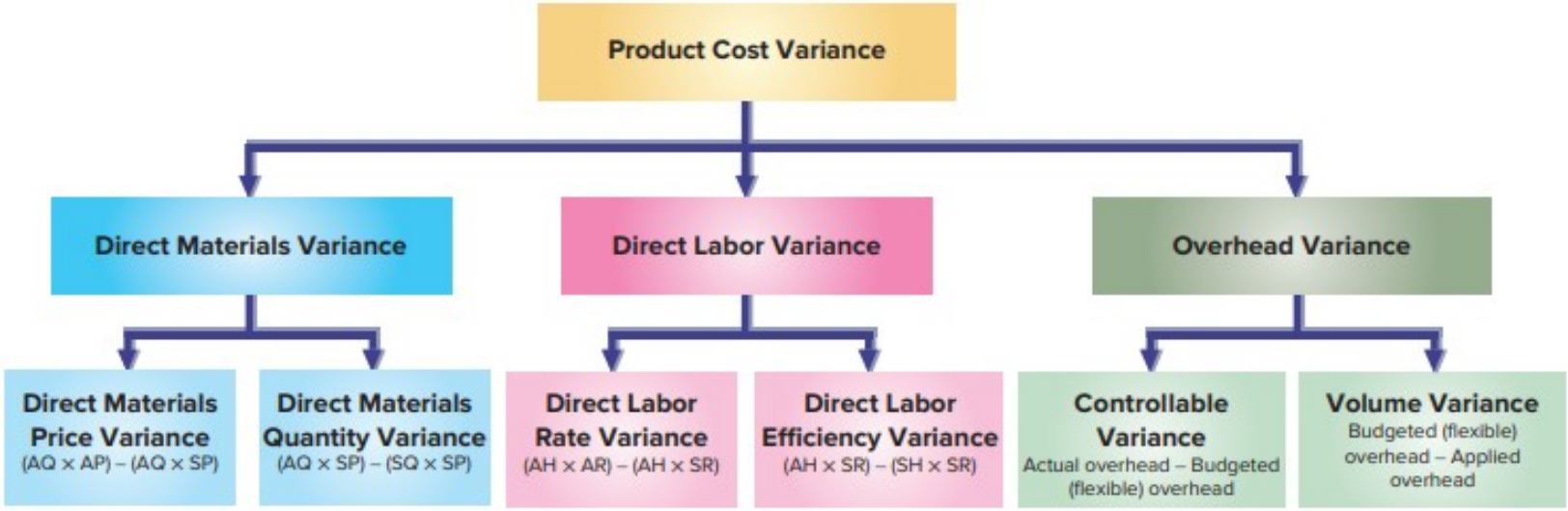
Variance Summary

Exhibit 23.17


Product Cost Variance
Direct Materials Variance
Direct Labor Variance
Overhead Variance
Direct Materials Price Variance
(AQ × AP) – (AQ × SP)
Direct Materials Quantity Variance
(AQ × SP) – (SQ × SP)
Direct Labor Rate Variance
(AH × AR) – (AH × SR)
Direct Labor Efficiency Variance
(AH × SR) – (SH × SR)
Controllable Variance
Actual overhead – Budgeted (flexible) overhead
Volume Variance
Budgeted (flexible) overhead – Applied overhead

Learning Objective P4: Compute overhead controllable and volume variances.

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Learning Objective A1

Analyze changes in sales from expected amounts.

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Sales Variances

A similar analysis can be applied to sales variances. We will use two additional G-Max products, Excel golf balls and Big Bert drivers, to illustrate.

	Budgeted	Actual
Sales of Excel golf balls (units)	1,000 units	1,100 units
Sales price per Excel golf ball	$10	$10.50
Sales of Big Bert drivers (units)	150 units	140 units
Sales price per Big Bert driver	$200	$190

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amounts,

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Computing Sales Variances

- **Sales price variance –actual sales price minus budgeted**
- **Sales volume variance – actual sales minus budg**

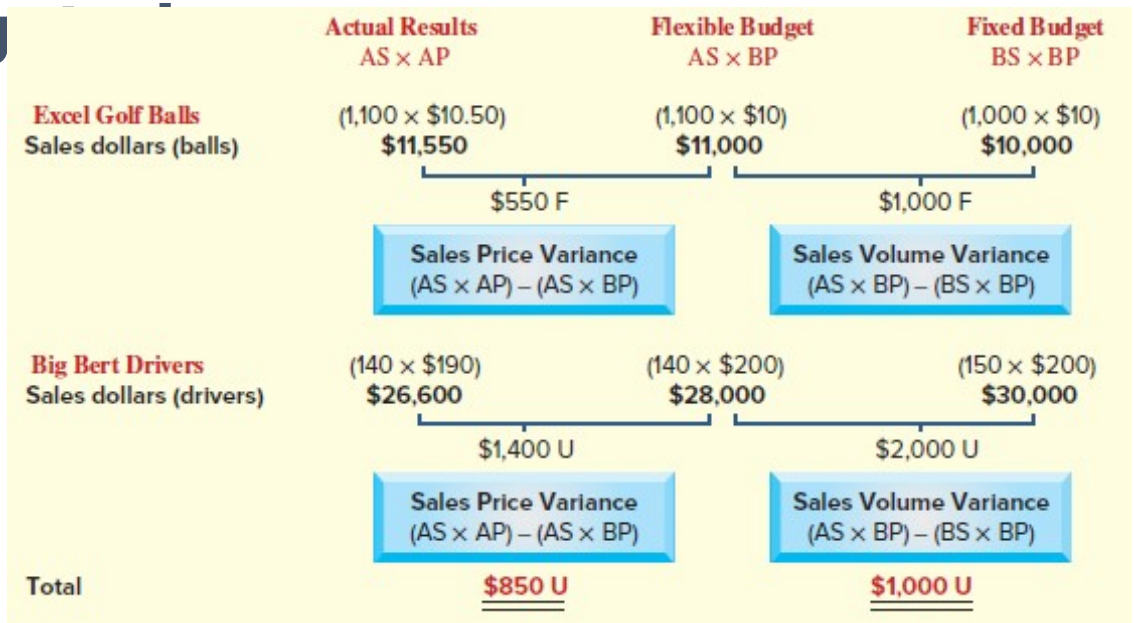

Exhibit 23.18

Learning Objective A1: Analyze changes in sales from expected amounts,

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Learning Objective P5

Appendix 23A
Compute overhead spending and efficiency variances.

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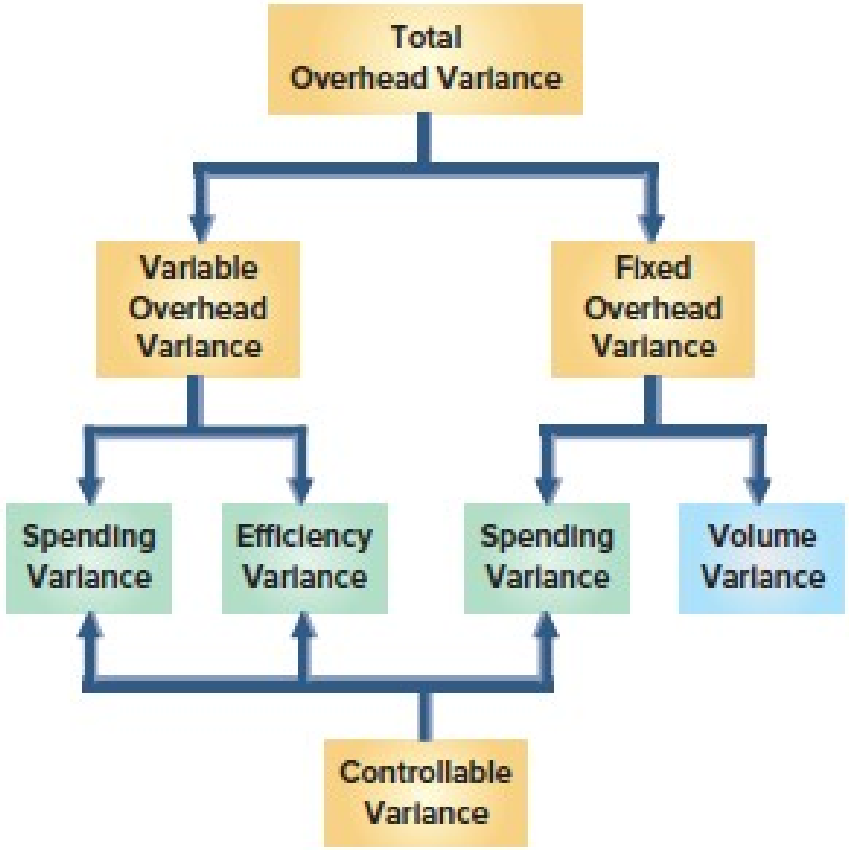
Expanded Framework for Total Overhead Variance

Exhibit 23A.1



Learning Objective P5: Compute overhead spending and efficiency variances.

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Computing Variable and Fixed Overhead Variances

Variable Overhead Variance	
Actual variable overhead (given in Exhibit 23.16)	$ 6,350
Standard variable overhead applied (3,500 units × 0.5 standard DLH × $4 VOH rate per DLH)	7,000
Variable overhead variance	$ 650 F
Fixed Overhead Variance	
Actual fixed overhead (given in Exhibit 23.16)	$ 11,800
Standard fixed overhead applied (3,500 units × 0.5 standard DLH × $6 FOH rate per DLH) .	10,500
Fixed overhead variance	$ 1,300 U

Learning Objective P5: Compute overhead spending and efficiency variances.

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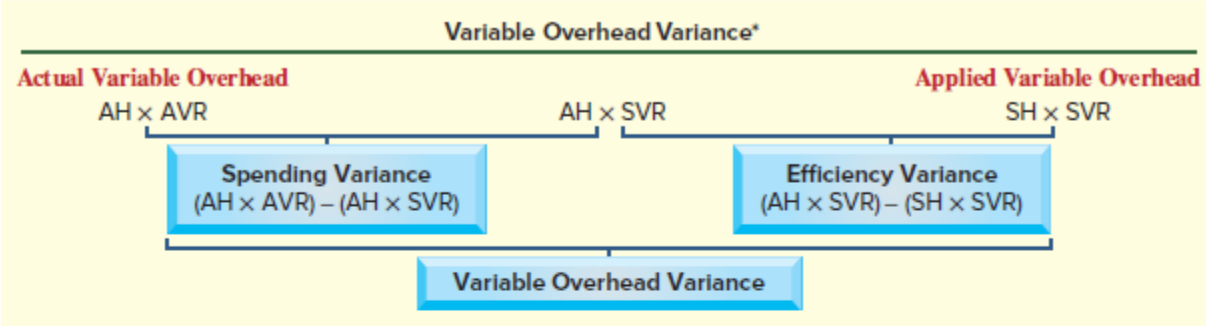
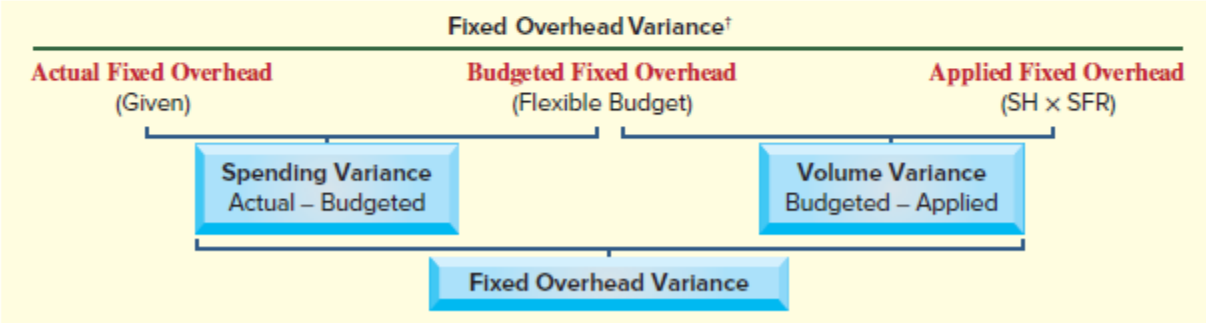
Expanded Overhead Variance Formulas

Exhibit 23A.2



*AH = actual direct labor hours; AVR = actual variable overhead rate; SH = standard direct labor hours; SVR = standard variable overhead rate.



†SH = standard direct labor hours; SFR = standard fixed overhead rate.

Learning Objective P5: Compute overhead spending and efficiency variances.

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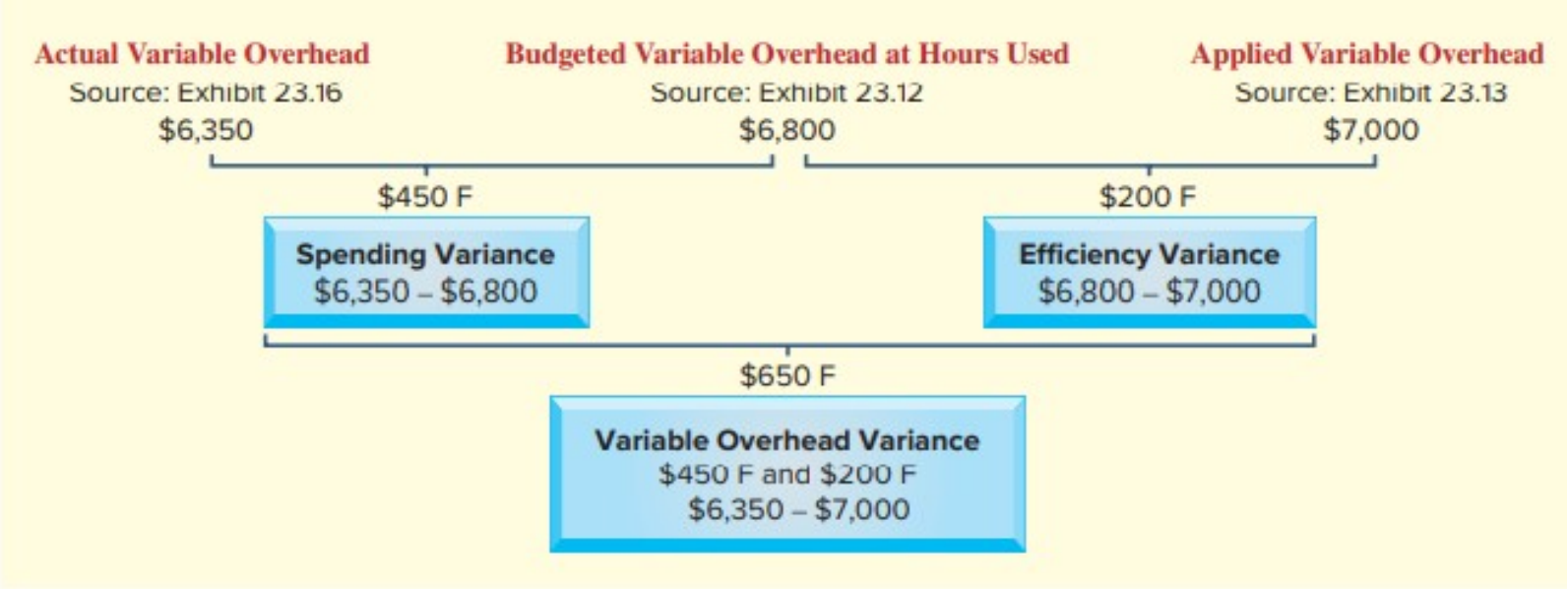
Variable Overhead Variance

Exhibit 23A.3



Learning Objective P5: Compute overhead spending and efficiency variances.

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Fixed Overhead Variance

Exhibit 23A.4

Learning Objective P5: Compute overhead spending and efficiency variances.

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Learning Objective P6

Appendix 23A

Prepare journal entries for standard costs and account for price and quantity variances.

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Direct Materials Journal Entry

Standard cost systems also record costs and variances in accounts. The entries in the next few slides briefly illustrate the important aspects of this process for G-Max's standard costs and variances for May.

Recording G-Max direct material costs.

May 31	Work in Process Inventory (standard cost)	35,000	
	Direct Materials Price Variance*	**1,800**	
	Direct Materials Quantity Variance	**1,000**	
	Raw Materials Inventory (actual cost)		37,800
	Record direct materials costs and variances.		

*Many companies record the materials price variance when materials are purchased. For simplicity, we record both the materials price and quantity variances when materials are issued to production.

Learning
quantity variances.

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Direct Labor Journal Entry

Recording G-Max labor costs for May

May 31	Work in Process Inventory (standard cost)	56,000	
	Direct Labor Rate Variance	**1,700**	
	Direct Labor Efficiency Variance		**1,600**
	Factory Wages Payable (actual cost)		56,100
	Record direct labor costs and variances.		

Learning Objective P6: Prepare journal entries for standard costs and account for price and quantity variances.

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Overhead Journal Entry

Recording G-Max overhead costs for May

May 31	Work in Process Inventory (standard cost)	17,500	
	Volume Variance	**1,500**	
	Controllable Variance		**850**
	Factory Overhead		18,150
	Apply overhead at standard rate of $10 per standard direct labor hour (1,750 hours) and record overhead variances.		

When Factory Overhead is applied to Goods in Process Inventory, the actual amount is credited to the Factory Overhead account. To account for the difference between actual and standard overhead costs, the entry includes a $500 debit to the Volume Variance, a $250 debit to the Variable Overhead Spending Variance, and a $100 credit to the Variable Overhead Efficiency Variance.

Learning Objective P6: Prepare journal entries for standard costs and account for price and quantity variances.

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End of Chapter 23

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